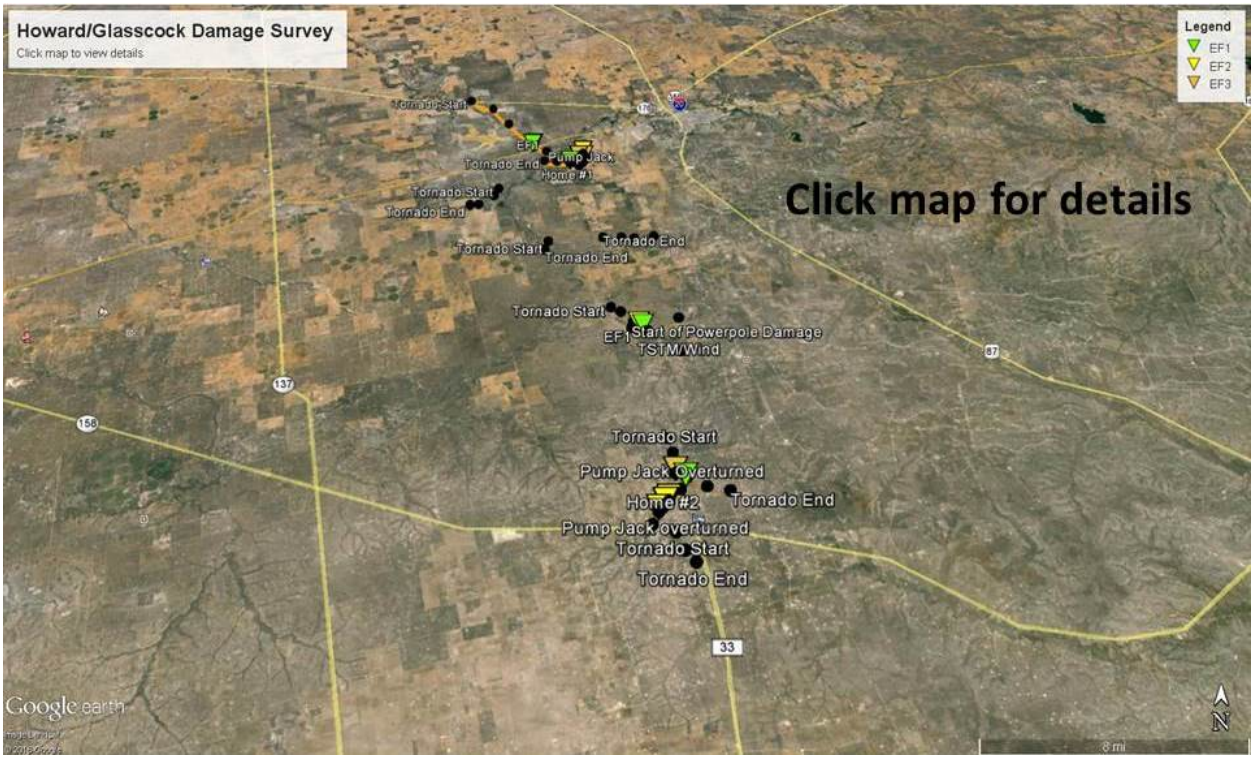
May 22, 2016 Howard and Glasscock County Tornadoes



On May 23, 2016, meteorologists from the National Weather Service in Midland conducted a damage survey over portions of Howard and Glasscock counties for damage caused by severe thunderstorms during the evening hours on Sunday, May 22.

Eyewitness reports from storm chasers and spotters in the area indicate that the initial tornado began at 6:13 PM CDT just south of Texas State Highway 176, approximately 10 miles west of Big Spring. The tornado then moved southeastward over open fields, bounded by Natural Dam Lake to its west and Wilkinson Road just to its east. The tornado continued on this southeast track along Salt Lake, eventually crossing Interstate 20 at approximately 6:32 pm CDT.

South of Interstate 20, the tornado exhibited erratic movement, being described by chasers and spotters as being “nearly stationary in a field.” Examination of radar imagery showed the primary storm circulation moved slowly southeastward to approximately ½ mile northwest of the intersection of Lintner Road and Rockhouse Road by 6:37 pm CDT, before turning eastward. The tornado continued to move east, with the southern periphery of the tornado affecting Home #1 (indicated on map). The tornado then began to move northeastward, crossing nearly directly over Home #2 around 6:40 pm CDT. A slight

east northeast turn allowed for only the tornado's northern periphery to affect Home #3 along Cauble Road around 6:42 pm CDT.

The tornado moved southward along or near Cauble Road. The tornado continued its erratic behavior, moving southwestward and re-entering the same field as previous around 6:48 pm CDT. The tornado then turned west-northwestward, eventually becoming quasi-stationary just east of the Home #1 between 6:52 pm and 6:54 PM CDT, before moving westward, just north of Home #1. Residents at home #1 described how long the tornado lasted and felt the tornado had impacted them twice. Based on the track indicated by storm chasers, spotters, and through examination of radar data, we believe this to be true. The tornado dissipated approximately 1 ½ miles west of Home #1 around 7 pm CDT.

The damage assessment team looked at several different indicators to determine tornado intensity. At Home #2, which likely was the closest and strongest structure to the tornado during the most intense portion of the tornado's life cycle, the entire roof was destroyed and exterior walls on this well-constructed residence were partially collapsed. This damage indicator suggests an EF3 intensity with wind speeds estimated at 140-160 mph. In the adjacent field east of Home #2, a 640 type pump jack was blown over. While not a formal damage indicator, similar type occurrences in past history would suggest that winds associated with EF3 tornadoes could cause pump jacks of this size to topple. The assessment team also looked at tree damage at Home #2. Both softwood and hardwood trees were viewed on the property. Damage to these large trees was indicative of high end EF2 to low end EF3 damage.

Home #1 and Home #3 experienced tornado damage indicative of EF2 damage. In the examples shown, large sections of the roof were removed, but with the walls still standing. At Home #3, there were power poles that were snapped approximately 5 feet off the ground. Wind speeds at this residence are estimated at 115 to 125 mph. At Home #1, trees were uprooted. Also, removal of the roof likely was aided by wind impacting an attached overhang on the

home. Wind speeds are estimated at this location of 105 to 115 mph.

Anticyclonic tornado - Image Courtesy of Aaron Jayjack

In total, eight tornadoes occurred on Sunday evening across Howard and Glasscock counties. One of the more viewed tornadoes during the event (referenced as "Tornado #2") was an anticyclonic tornado that was visible from Interstate-20. Tornado #2 developed at around 6:51 pm CDT, approximately 3 miles south of the interstate, close to Farm-to-Market Road 818. This tornado moved slowly east and then northeast. With the help of radar imagery, it is estimated that the tornado lasted 8 minutes, while travelling a path just short of 2 miles. With the tornado remaining over open fields, the assessment team rated the tornado as an EF0. The width was estimated at 100 yards.

Spotters and storm chasers provided several reports of tornadoes located west of the Lees, located at the intersection of Farm to Market Road 461 and Ranch Road 33 near the Glasscock and Howard County line. Based on reports and review of radar data, we have identified two tornadoes in this area. Tornado #3 began at approximately 7:17 pm CDT just over 2 ½ miles NNE of Lees. The tornado traveled a 2.3 mile path, moving westward. The tornado dissipated approximately 4 miles northwest of Lees at 7:28 pm CDT. Without damage indicators, the tornado is rated as an EF0 with an estimated width of 100 yards.

At 7:38 pm CDT, tornado #4 was briefly viewed by Glasscock Co. law enforcement officials approximately 4 miles southeast of Lomax. This short-lived tornado traveled a distance of approximately ½ mile, dissipating by 7:40 pm CDT. With no damage indicators, this tornado is rated as an EF0 with an estimated path length of 50 yards.

As the supercell thunderstorm moved southward along Ranch Road 33, tornado #5 developed at 755 pm CDT, approximately 4 miles southwest of Lees, north of Hillger Road. The tornado, estimated at 200 yards wide, snapped 14 power poles along Hillger Road as it moved slowly southeast. With the poles being snapped approximately 5 feet off the ground, wind speeds were estimated at approximately 115 mph, indicating a lower-end EF2 tornado intensity. There was also a nearby metal building just south of Hillger Road which sustained a loss of metal roof panels due to the tornado. Wind speeds at this location were estimated at 90-100 mph, indicating EF1 intensity. As it weakened in intensity, this slow moving tornado made an abrupt turn to the northeast and dissipated at 8:07 pm CDT near the intersection of Hillger Road and Ranch Road 33.

west of Ranch Road 33. This damage indicator suggested the tornado had weakened to EF1 intensity at that point. This weakening trend coincided with the tornado taking a more southeast track as it crossed Ranch Road 33. The tornado dissipated at 8:54 PM CDT, 2 miles north of Garden City. In total, the tornado traveled a 3.7 mile path, with and estimated width of 200 yards.

have sustained lower-end EF2 damage. It is noted however that the barn construction made it more susceptible to wind entering the structure, which could have result in damage at a lower wind threshold. Wind speeds are estimated at 100-115 mph with this damage.

As the tornado to move southwestward, it was the opinion of the assessment team that the tornado intensified. At approximately 9:01 PM CDT, the tornado knocked over a 320 type pump jack west of Tornado #6 developed just west of Ranch Road 33, 4 miles NNW of Garden City around 8:42 pm CDT. The tornado moved southward, knocking over a 640 type pump jack located approximately 2 ¼ miles north of Garden City. This type of occurrence is associated with wind speeds in the 140-160 mph range. Thus, the tornado has been rated as briefly reaching EF3 intensity. Broken tree limbs were observed by the assessment team 2 miles north of Garden City, just

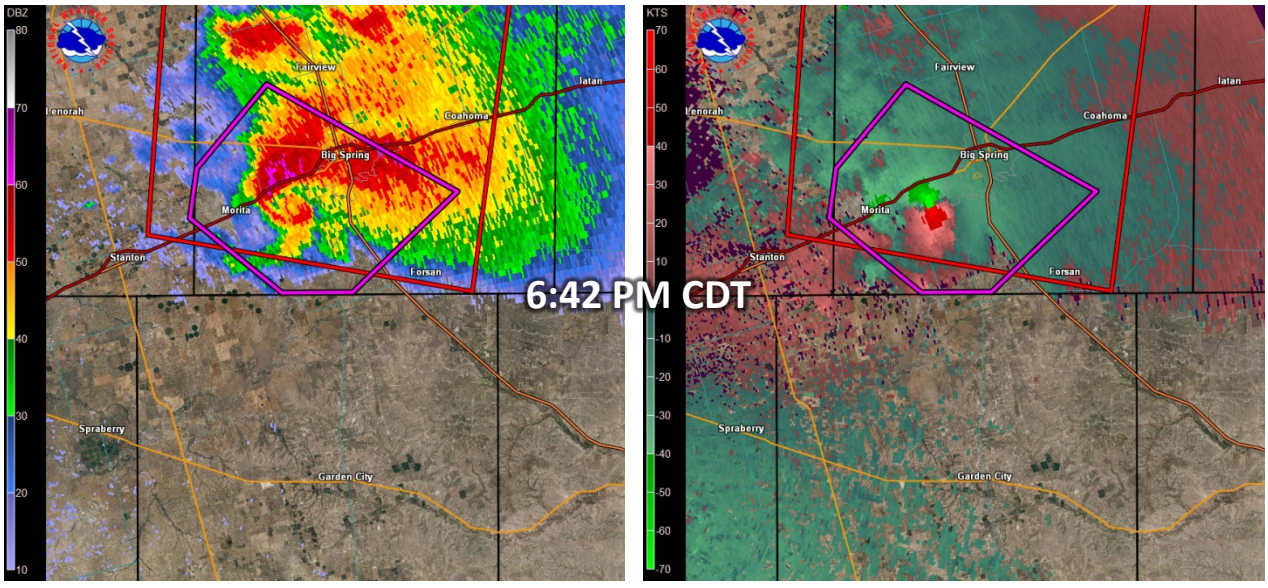
Tornado #7 developed around at 8:56 PM CDT, just over 1 ½ miles NNW of Garden City. This tornado produced a combination of EF1 and EF2 damage at two residences. A single-wide manufactured home at Home #1 was rolled and destroyed. This was indicative of damage produced by a tornado of EF2 intensity. As the tornado moved southwestward and impacted Home #2, a combination of EF1 and EF2 damage was noted. Tree damage was indicative of EF1, while the metal barn appears to

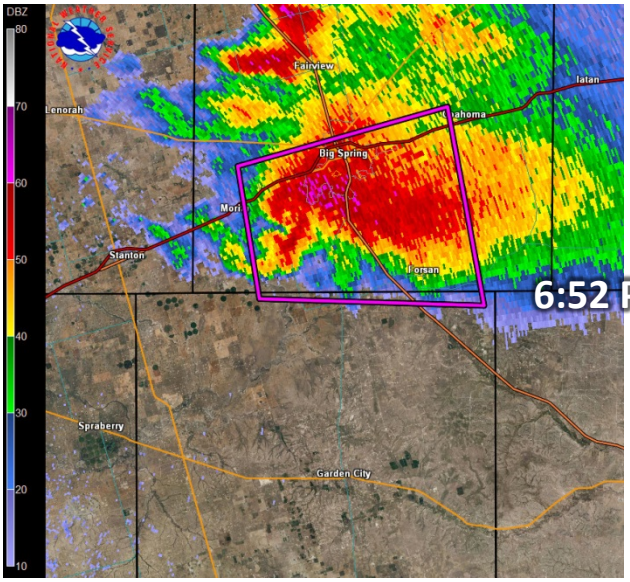
County Road 417. With this slightly smaller pump jack type, it was felt that winds in the 120-135 mph range could potentially produce this damage. Thus, we rated the tornado as being of high-end EF2 intensity. Oil field workers noted that there was damage over open fields farther to the southwest. Using radar estimates, the team concluded that this tornado dissipated at 9:02 pm CDT just short of reaching Highway 158, 1 ½ miles west of Garden City. The total path length for tornado #7 was 1.9 miles with its greatest width estimated at 150 yards.

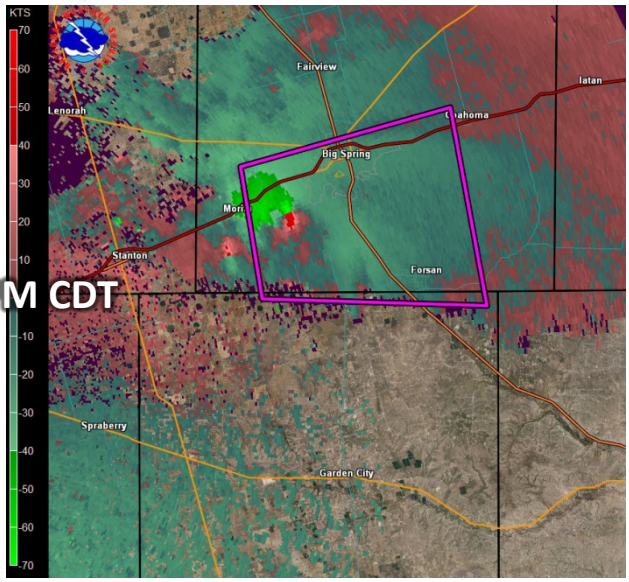
As the supercell thunderstorm began to take more of a southeast movement, tornado #8 formed at 9:02 pm CDT, south of Highway 158, approximately ¾ mile southwest of Garden City. No damage indicators were noted with this short-lived tornado that remained over open fields during its 1.4 mile path. Radar imagery suggests that the tornado dissipated around 9:08 pm CDT. We have estimated the intensity of this tornado at EF-0.

In summary, one supercell thunderstorm produced 8 tornadoes over in a 3 hour span of time across Howard and Glasscock counties. This included 4 strong tornadoes (two EF-3 and two EF-2), and 4 EF-0 weaker tornadoes.

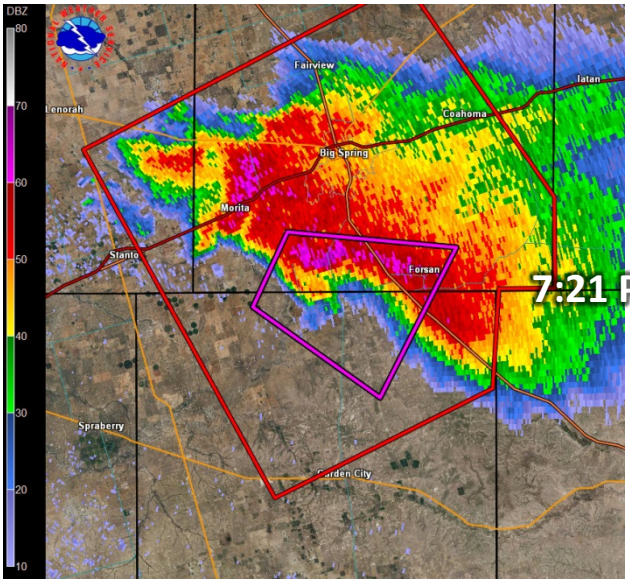
Radar Imagery from the Event

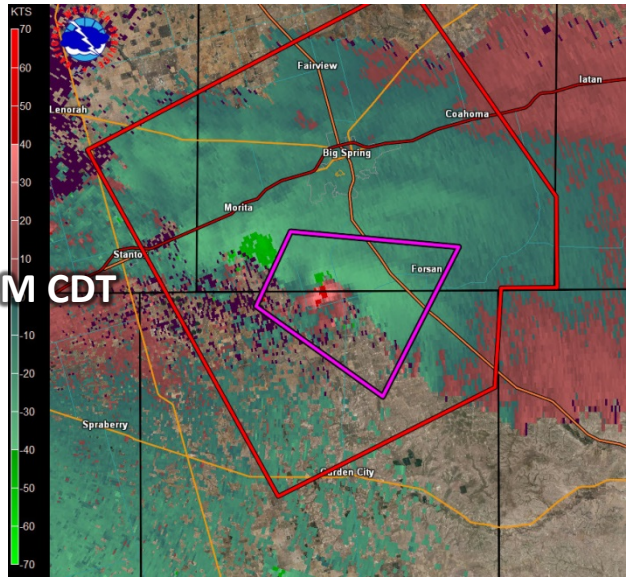






6:52 PM CDT





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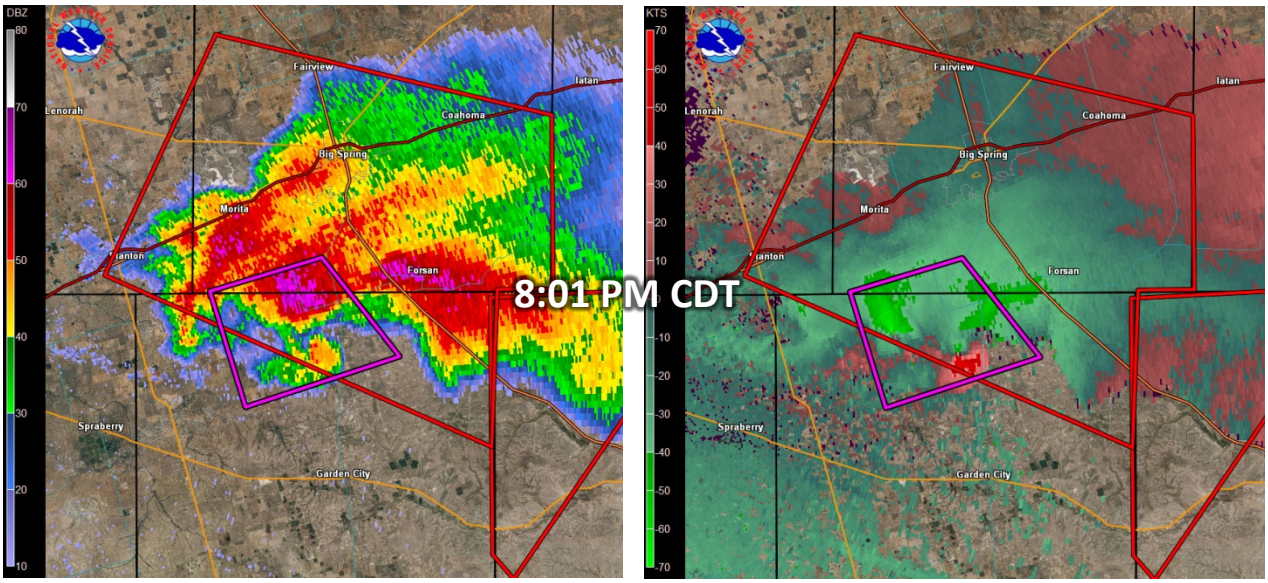
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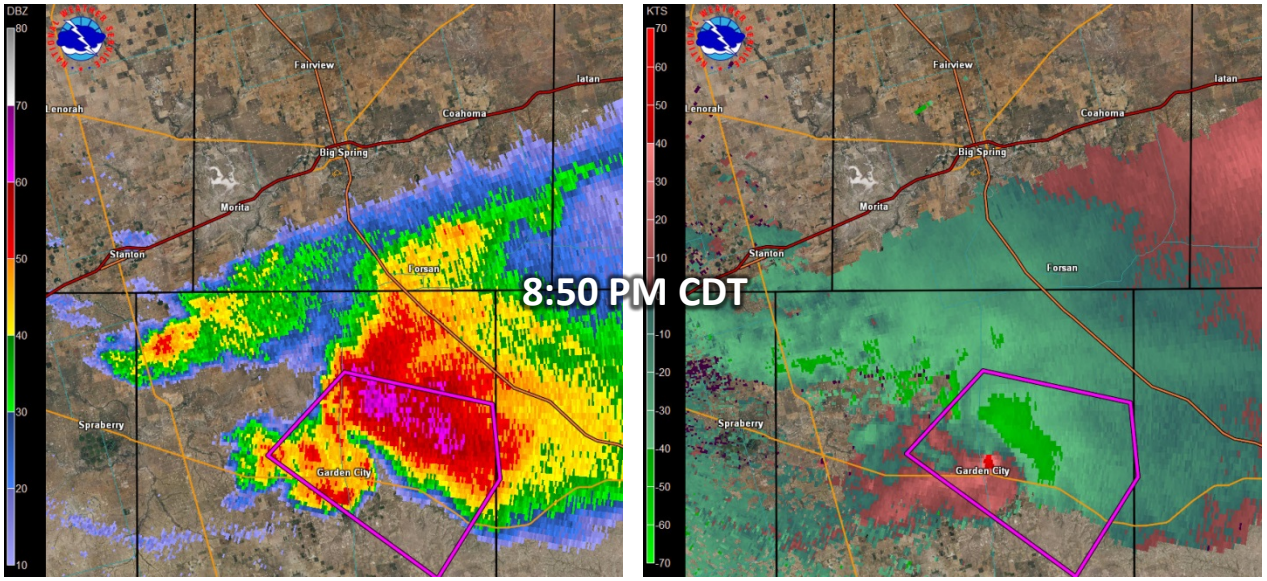
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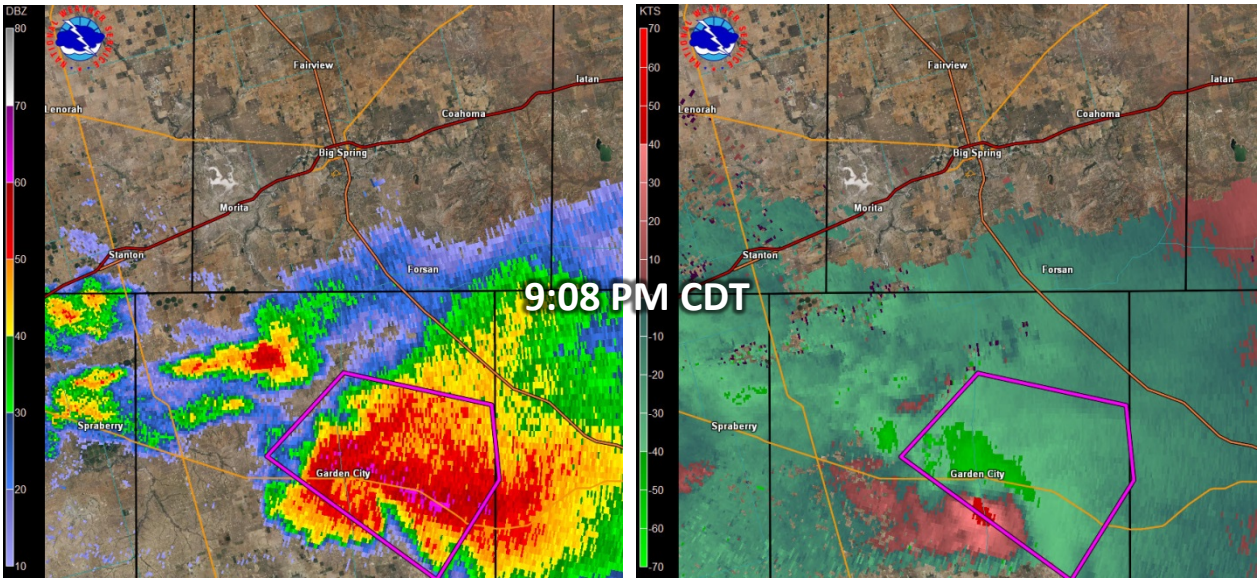
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